

In the Claims:

Please amend claims 1 and 40, as follows:

1. (Thrice Amended) A method for producing a boride layer on a surface by plasma boronizing comprising the steps of:

supplying a gas mixture containing a boron-releasing gas to a treatment chamber of a reactor;

generating a glow discharge in the reactor;

determining an amount of at least one excited boron-releasing gas product

selected from excited boron and excited BCI particles in the glow discharge; and

selecting production parameters of the plasma generated in the treatment chamber of the reactor and one or more process parameters selected from at least one of voltage, pulse duty factor, frequency, temperature and pressure, depending on the determined amount of the excited boron-releasing gas product so as to maintain at least one of: at least one of a minimum value and a maximum value of the determined excited boron-releasing gas product, and at least one of a minimum value or a maximum value of a relation of one or more of the determined amount of the excited boron-releasing gas product to another glow discharge product so as to produce the boride layer on the surface.

40. (Amended) A method for producing a boride layer on a surface by plasma boronizing comprising the steps of:

supplying a gas mixture containing a boron-releasing gas to a treatment chamber of a reactor;

generating a glow discharge in the reactor;

determining a first amount of at least one excited boron-releasing gas product selected from excited boron and excited BCI particles in the glow discharge;

selecting first values for production parameters of the plasma generated in the treatment chamber of the reactor and one or more process parameters selected from at least one of voltage, pulse duty factor, frequency, temperature and pressure, depending on the first determined amount of the excited boron-releasing gas product so as to maintain at least one of: at least one of a minimum value and a maximum value of the excited boron-releasing gas product, and at least one of a minimum value or a maximum value of a relation of one or more of the amount of the first determined excited boron-releasing gas product to another glow discharge product to produce the boride layer on the surface;

determining a second amount of at least one excited boron-releasing gas product in the glow discharge; and

returning to the selecting step to be performed using selecting second values instead of the ~~first~~ first values.